FLUIDTIGHT LEVEL DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a device using gravity force to provide level, and more particularly to a device using a floating body to float on a fluid surface in order to allow the floating body to maintain at a level state. The level device according to the present invention can be combined with a laser ray indicator to use on indication for level and/or plumb.

2. Description of Related Art

A visible laser ray level and/or plumb indicator is always used in construction, architecture or upholstery work to provide a mark on the surface of a construction object to maintain an accurate level and/or plumb.

US Patent no. 5,619,802 "Automatic Level and Plumb Tool" discloses that a laser module being able to emit visible light can be disposed in fluid. A spring is connected at the upper side of the laser module to allow the laser module to maintain at a level state in the fluid. The laser module can emit a lever indication ray and plumb indication ray to pass respectively through the fluid to project on other subject. The arrangement to lead the laser ray to pass the fluid could yield refraction phenomena; this may influence the indication accuracy of the level ray and the plumb ray.

US Patent no. 6,177,987 "Laser Level" discloses that a laser module, which is able to emit visible light, is connected with a shaft. The two ends of the shaft are pivoted to the opposite sides of a container. The bottom part of

the laser module is disposed in a fluid, which is stored in the container. The laser module can adjust its own level automatically by floating force yielded from the fluid when the container is inclined. But, when the container is inclined along the two ends of the shaft. The laser module has no way to use the floating force of the fluid to adjust level automatically. Moreover, the container without a cover can prevent the fluid from leaking out of the container during transportation.

SUMMARY OF THE INVENTION

The main object of the present is to provide a level device, connecting a film at the opening of a container to prevent fluid in the container from leaking out thereof. A shaft is connected to the film, and one end of the shaft is connected to a floating body while another end of the shaft is projected out of the container to connect with a seat body.

Another object of the present invention is to provide a level device, adjusting automatically the level of the seat body installed outside the container by floating body installed in the fluid.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention can be more fully understood by reference to the following description and accompanying drawings, in which:

FIG. 1 is an explosive schematic view of a level device according to the present invention;

FIG. 2 is a sectional schematic view of a level device according to the present invention;

FIG. 3 is a sectional schematic view of a level device in use according to the present invention; and

FIG. 4 is a sectional schematic view of a level device used in fixing a floating body according to the present invention;

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Please refer to FIG. 1 and 2. A level device according to the present invention comprises a container 10, a screw bolt 20 screwed to the outside part of the bottom of the container 10, a first film 30 connected to the inner part of the bottom of the container 10, a floating body 40 whose bottom is connected with a pairing weight block 41 and upper end is connected to the bottom 51 of a shaft 50, a second film 60 passed through by and connected with the shaft 50, a cover having a hole 71 for the shaft 50 to pass through and to exist a space between the hole 71 and the shaft 50, a seat body 80 connected at the upper end of the shaft 50 and a laser module 90 engaged in a hole 81 disposed in the seat body 80. Here, the cover 70 has a bigger-opening-shaped engaging part 711 at the lower part of the hole 71 as Fig. 2 shows. The upper end of the bottom part 51 of the shaft 50 has an engaging part 511 whose projecting shape is matched with the shape of the engaging part 711. The circumference of the second film 60 is connected to the opening of the container 10. The cover 70 is connected to the opening of the container 10 and the outside of the second film 60.

Please refer to Fig. 3. When the level device according to the present invention is used, a proper amount of fluid

11, which is a fluid material such as water or oil or mixture of both, is filled into the container 10. A proper pairing weight block 41 is chosen to cause the floating body 40 to float on the surface of the fluid 11 after the floating body 40, the shaft 50, the seat body 70 and the laser module 90 are connected together. The floating body 40 can adjust itself automatically to allow its center of gravity to be perpendicular to the earth's center so as to maintain the seat body 80 and the laser module 90 horizontally by the floating force of the fluid 11 even if the container 10 is inclined at a certain angle. The connection angle between the second film 60 and the shaft 50 can be adjusted without being torn apart from each other at the connection point of the second film 60 and the shaft 50 because the second film 60 is flexible. The fluid 11 cannot be leaked out of the container 10 by sealing the opening of the container 10 with the second film 60.

Finally, please refer to Fig. 4. The screw bolt 20 can be rotate upward to press against the flexible first film 30 to cause the first film 30 to push the pairing weight block 41 upward. Consequently, the floating body 40 and the bottom part of the shaft 50 are moved upward to cause the engaging part 511 of the bottom part 51 to engage with the engaging part 711 of the cover 70. Therefore, the floating body 40 is fixed in the container 10 and not to be shaken.

The first film 30 and the second film 60 of the present invention can be made from a flexible material such as silicon, rubber or plastic. The container 10, the floating body 40, the shaft 50, the cover 70, the seat body 80 and etc can

be made from a plastic or metal material. The second film 60 is used to connect with the shaft 50 to keep the shaft 50 to be located in the middle of the opening 71 of the cover 70 so as to prevent the fluid 11 from leaking out of the container 10.

The seat body 80 of the present invention can be connected with a variety of different modules 90. And, level indication and/or plumb indication laser ray emitted from the laser module 90 is projected on the surface of an object directly instead of passing through a fluid else first. Therefore, the better level and/or plumb accuracy can be obtained.

It is noted that the level device described above is the preferred embodiment of the present invention for the purpose of illustration only, and are not intended as a definition of the limits and scope of the invention disclosed. Any modifications and variations that may be apparent to a person skilled in the art are intended to be included within the scope of the present invention.